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Aist et al.

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(54) **NAVIGATION SYSTEM WITH ROUTE GUIDANCE MECHANISM AND METHOD OF OPERATION THEREOF**

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G01C 21/36 (2006.01)

(52) **U.S. Cl.**
CPC ***G01C 21/3679*** (2013.01); ***G01C 21/3644*** (2013.01)

(58) **Field of Classification Search**
CPC G01C 21/26; G01C 21/36; G01C 21/00; G01C 21/3611; G01C 1/096827
USPC 701/400
See application file for complete search history.

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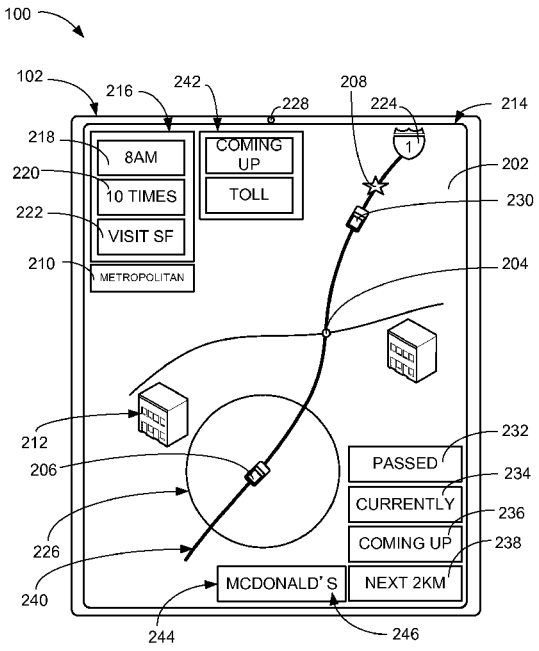
(57) **ABSTRACT**

A method of operation of a navigation system includes: determining a travel context based on a travel condition; determining a guidance landmark based on a candidate landmark; and generating a navigation guidance with a control unit having the guidance landmark suited for the travel context for presenting with a device.

20 Claims, 7 Drawing Sheets



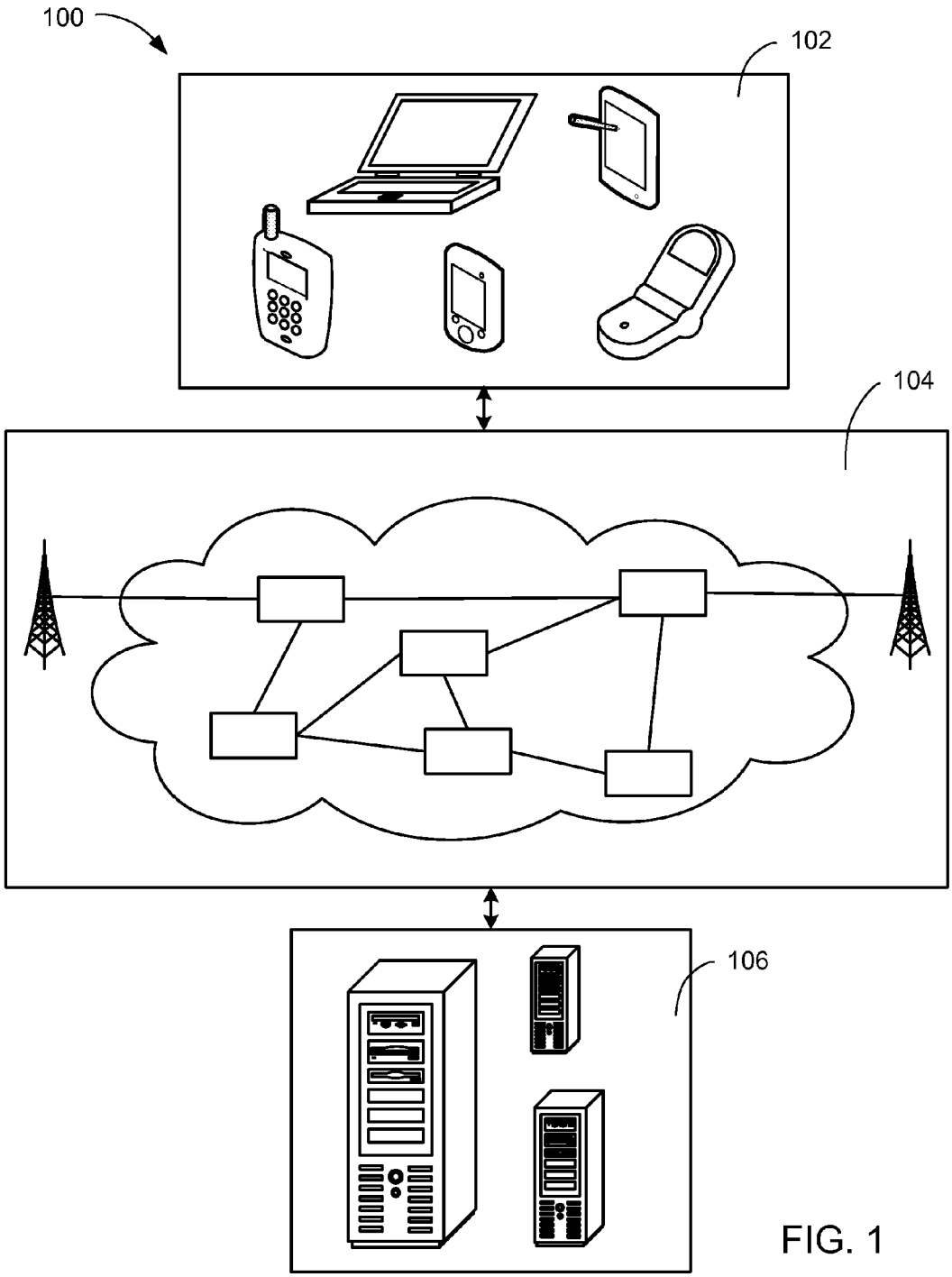
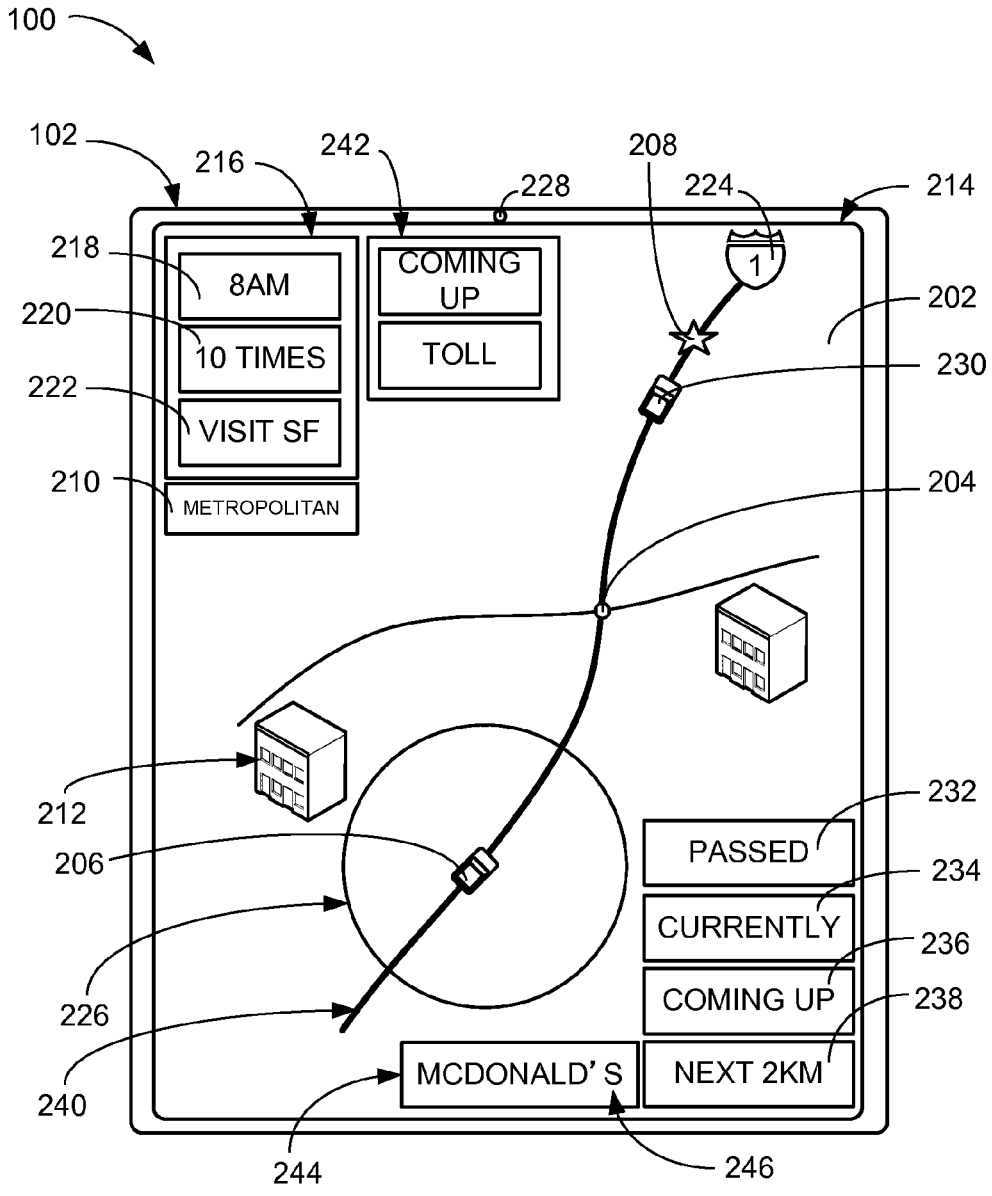


FIG. 1


100
102
216
242
228
208
224
214
218
8AM
COMING UP
220
10 TIMES
TOLL
222
VISIT SF
210
METROPOLITAN
1
202
230
204
212
206
226
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244
246
232
PASSED
234
CURRENTLY
236
COMING UP
238
MCDONALD' S
NEXT 2KM

FIG. 2

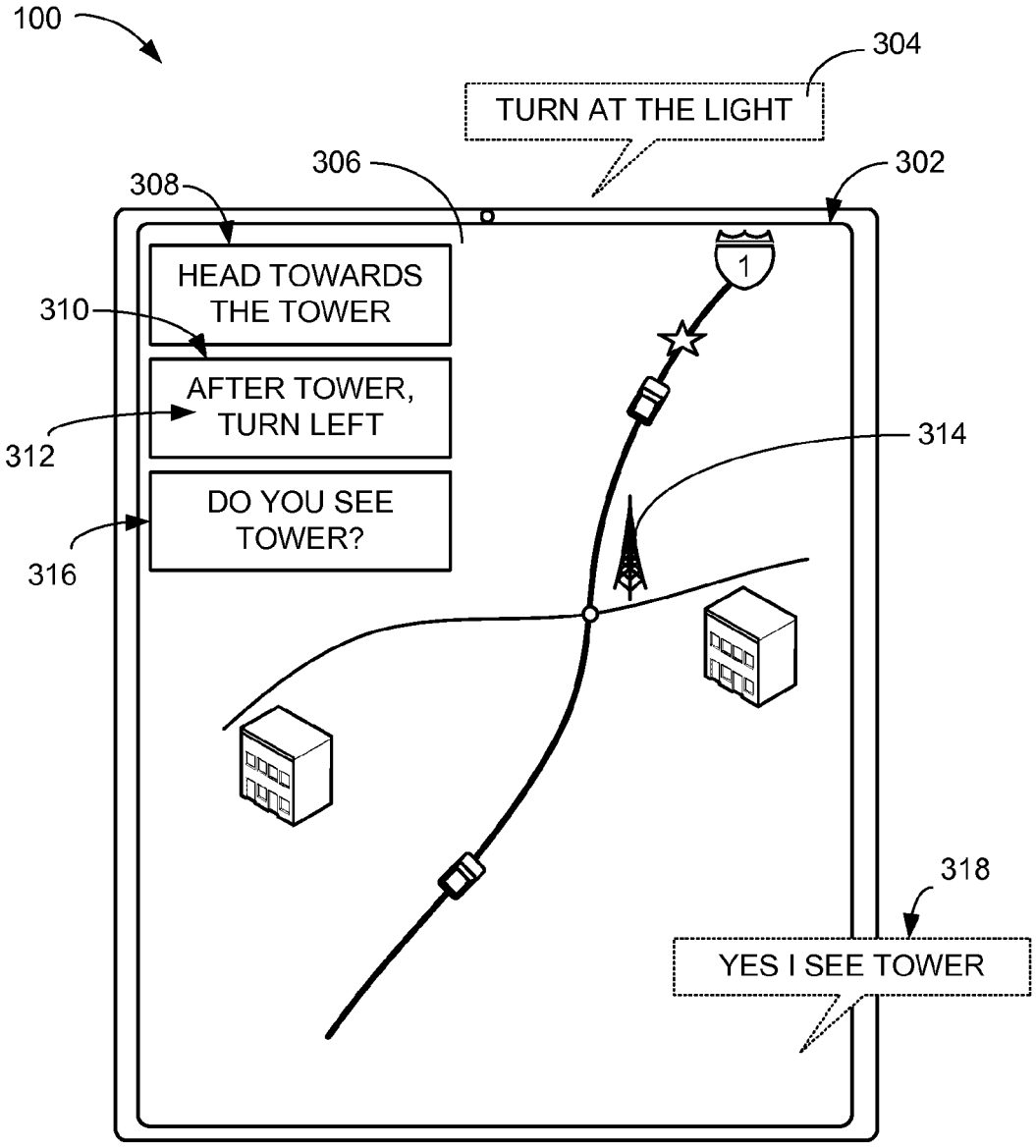
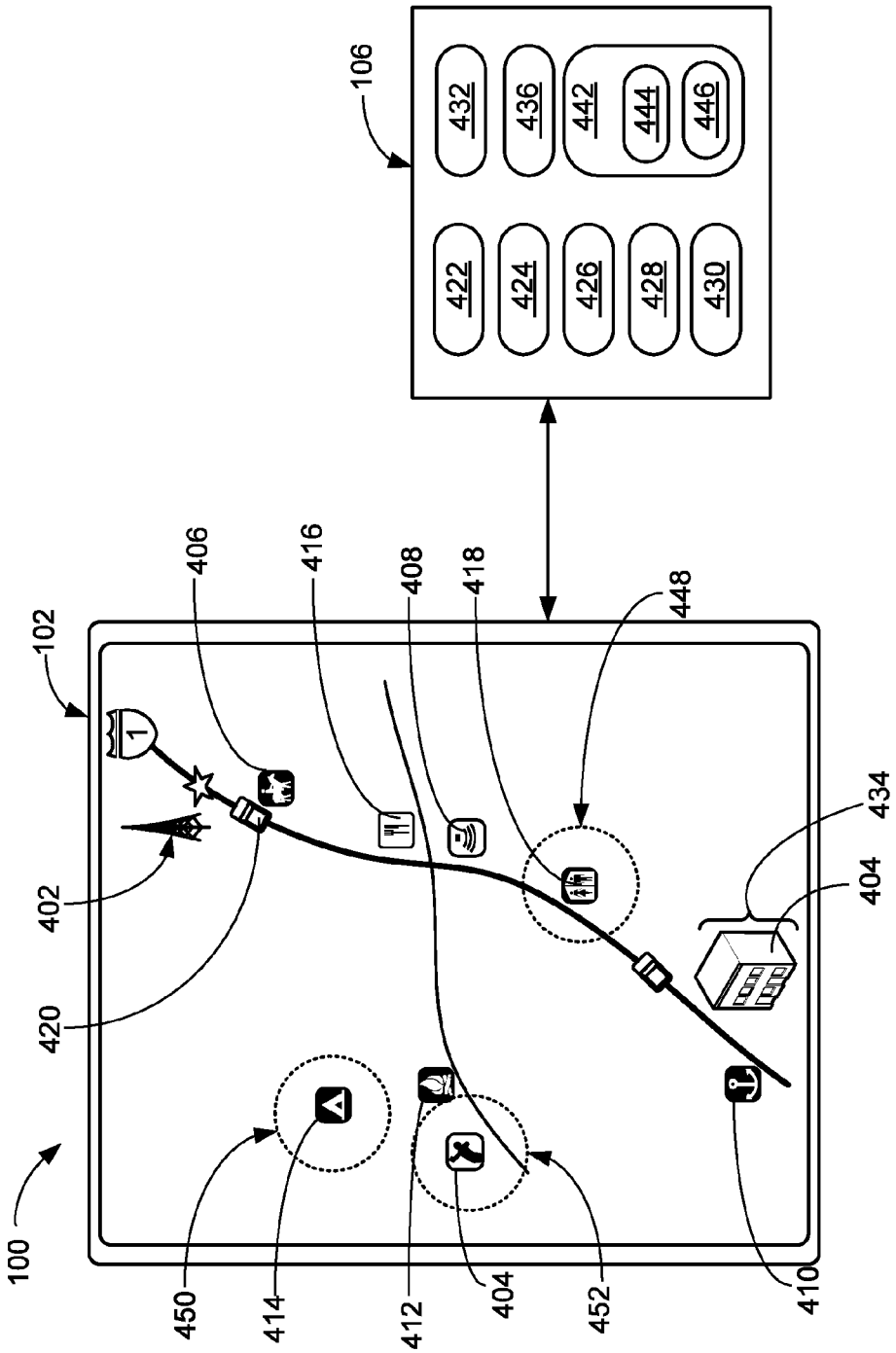

100
304
TURN AT THE LIGHT
306
302
308
HEAD TOWARDS THE TOWER
310
AFTER TOWER, TURN LEFT
312
DO YOU SEE TOWER?
316
1
314
318
YES I SEE TOWER

FIG. 3


106
432
436
442
444
446
422
424
426
428
430
102
406
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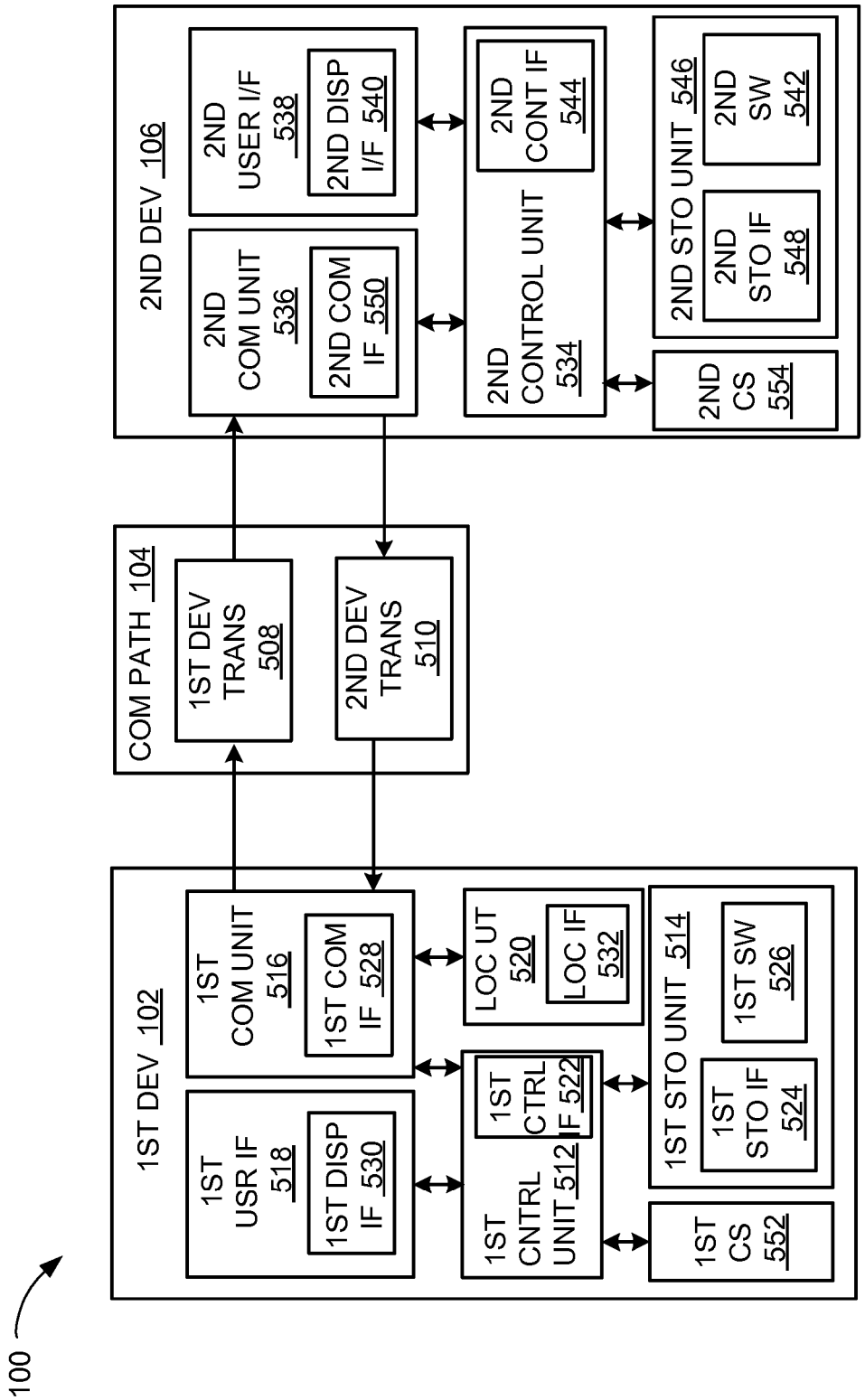
408
418
448
402
420
434
404
100
450
414
412
404
452
410

FIG. 4


100
1ST DEV 102
1ST USR IF 518
1ST DISP IF 530
1ST COM UNIT 516
1ST COM IF 528
1ST CNTRL UNIT 512
1ST CTRL IF 522
LOC UT 520
LOC IF 532
1ST STO UNIT 514
1ST STO IF 524
1ST SW 526
1ST CS 552
COM PATH 104
1ST DEV TRANS 508
2ND DEV TRANS 510
2ND DEV 106
2ND USER I/F 538
2ND DISP I/F 540
2ND COM UNIT 536
2ND COM IF 550
2ND CONTROL UNIT 534
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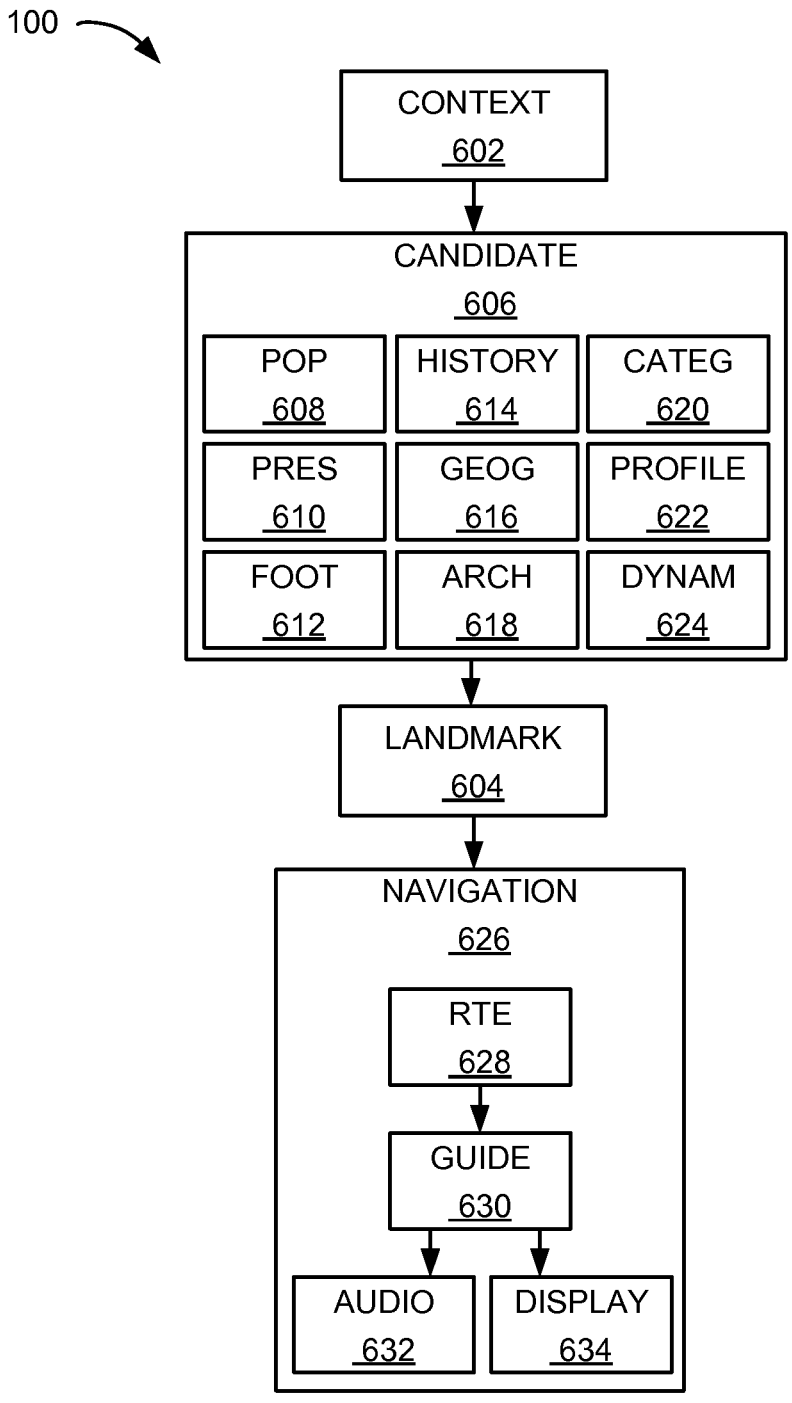
2ND SW 542
2ND CS 554

FIG. 5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CONTEXT
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CANDIDATE
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POP
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PRES
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612
ARCH
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RTE
628
GUIDE
630
AUDIO
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DISPLAY
634

FIG. 6

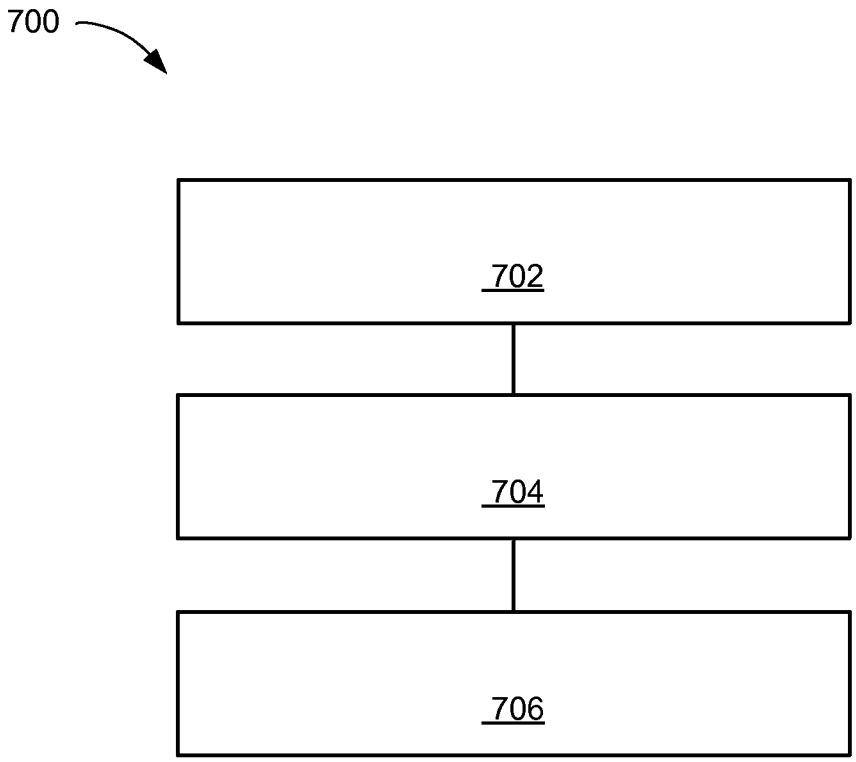

FIG. 7

NAVIGATION SYSTEM WITH ROUTE GUIDANCE MECHANISM AND METHOD OF OPERATION THEREOF

CROSS-REFERENCE TO RELATED APPLICATION(S)

The present application contains subject matter related to a concurrently filed U.S. patent application by Gregory Stewart Aist, Jose Sebastian, Aliasgar Mumtaz Husain, and Casey Carter entitled "NAVIGATION SYSTEM WITH LANDMARK RECOGNITION MECHANISM AND METHOD OF OPERATION THEREOF." The related application Ser. No. 14/160,097 is assigned to Telenav, Inc. The subject matter thereof is incorporated herein by reference thereto.

The present application contains subject matter related to a concurrently filed U.S. patent application Ser. No. 14/160,186 by Gregory Stewart Aist, Jose Sebastian, Aliasgar Mumtaz Husain, and Casey Carter entitled "NAVIGATION SYSTEM WITH DATA GATHERING MECHANISM AND METHOD OF OPERATION THEREOF." The related application is assigned to Telenav, Inc. The subject matter thereof is incorporated herein by reference thereto.

TECHNICAL FIELD

The present invention relates generally to a navigation system, and more particularly to a system with route guidance mechanism.

BACKGROUND ART

Modern portable consumer and industrial electronics, especially client devices such as navigation systems, cellular phones, portable digital assistants, and combination devices, are providing increasing levels of functionality to support modern life including location-based information services. Research and development in the existing technologies can take a myriad of different directions.

As users become more empowered with the growth of mobile location based service devices, new and old paradigms begin to take advantage of this new device space. There are many technological solutions to take advantage of this new device location opportunity. One existing approach is to use location information to provide navigation services such as a global positioning system (GPS) for a car or on a mobile device such as a cell phone, portable navigation device (PND) or a personal digital assistant (PDA).

Location based services allow users to create, transfer, store, and/or consume information in order for users to create, transfer, store, and consume in the "real world." One such use of location based services is to efficiently transfer or route users to the desired destination or service.

Navigation systems and location based services enabled systems have been incorporated in automobiles, notebooks, handheld devices, and other portable products. Today, these systems aid users by incorporating available, real-time relevant information, such as maps, directions, local businesses, or other points of interest (POI). The real-time information provides invaluable relevant information.

However, a navigation system improving route guidance mechanism to adjust reference point has become a paramount concern for the consumer. The inability decreases the benefit of using the tool.

Thus, a need still remains for a navigation system with route guidance mechanism to adjust the current location of a device. In view of the increasing mobility of the workforce and social interaction, it is increasingly critical that answers be found to these problems. In view of the ever-increasing commercial competitive pressures, along with growing consumer expectations and the diminishing opportunities for meaningful product differentiation in the marketplace, it is critical that answers be found for these problems. Additionally, the need to reduce costs, improve efficiencies and performance, and meet competitive pressures adds an even greater urgency to the critical necessity for finding answers to these problems. Solutions to these problems have been long sought but prior developments have not taught or suggested any solutions and, thus, solutions to these problems have long eluded those skilled in the art.

DISCLOSURE OF THE INVENTION

The present invention provides a method of operation of a navigation system including: determining a travel context based on a travel condition; determining a guidance landmark based on a candidate landmark; and generating a navigation guidance with a control unit having the guidance landmark suited for the travel context for presenting with a device.

The present invention provides a navigation system, including: a control unit for: determining a travel context based on a travel condition, determining a guidance landmark based on a candidate landmark, and generating a navigation guidance having the guidance landmark suited for the travel context, and a communication interface, coupled to the control unit, for communicating the navigation guidance for presenting on a device.

The present invention provides a navigation system having a non-transitory computer readable medium including: determining a travel context based on a travel condition; determining a guidance landmark based on a candidate landmark; and generating a navigation guidance having the guidance landmark suited for the travel context for presenting with a device.

Certain embodiments of the invention have other steps or elements in addition to or in place of those mentioned above. The steps or element will become apparent to those skilled in the art from a reading of the following detailed description when taken with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a navigation system with route guidance mechanism in an embodiment of the present invention.

FIG. **2** is an example of a geographic area traveled by the user of the navigation system.

FIG. **3** is an example of a navigation guidance.

FIG. **4** is an example of the guidance landmark of FIG. **3**.

FIG. **5** is an exemplary block diagram of the navigation system.

FIG. **6** is a control flow of the navigation system.

FIG. **7** is a flow chart of a method of operation of the navigation system in a further embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

The following embodiments are described in sufficient detail to enable those skilled in the art to make and use the invention. It is to be understood that other embodiments would be evident based on the present disclosure, and that system, process, or mechanical changes may be made without departing from the scope of the present invention.

In the following description, numerous specific details are given to provide a thorough understanding of the invention. However, it will be apparent that the invention may be practiced without these specific details. In order to avoid obscuring the present invention, some well-known circuits, system configurations, and process steps are not disclosed in detail.

The drawings showing embodiments of the navigation system **100** are semi-diagrammatic and not to scale and, particularly, some of the dimensions are for the clarity of presentation and are shown exaggerated in the drawing FIGS. Similarly, although the views in the drawings for ease of description generally show similar orientations, this depiction in the FIGS. is arbitrary for the most part. Generally, the invention can be operated in any orientation. The embodiments have been numbered first embodiment, second embodiment, etc. as a matter of descriptive convenience and are not intended to have any other significance or provide limitations for the present invention.

One skilled in the art would appreciate that the format with which navigation information is expressed is not critical to some embodiments of the invention. For example, in some embodiments, navigation information is presented in the format of (X, Y), where X and Y are two ordinates that define the geographic location, i.e., a position of a user.

In an alternative embodiment, navigation information is presented by longitude and latitude related information. In a further embodiment of the present invention, the navigation information also includes a velocity element including a speed component and a heading component.

The term "relevant information" referred to herein includes the navigation information described as well as information relating to points of interest to the user, such as local business, hours of businesses, types of businesses, advertised specials, traffic information, maps, local events, and nearby community or personal information.

The term "module" referred to herein can include software, hardware, or a combination thereof in the present invention in accordance with the context in which the term is used. For example, the software can be machine code, firmware, embedded code, and application software. Also for example, the hardware can be circuitry, processor, computer, integrated circuit, integrated circuit cores, a pressure sensor, an inertial sensor, a microelectromechanical system (MEMS), passive devices, or a combination thereof.

Referring now to FIG. **1**, therein is shown a navigation system **100** with route guidance mechanism in an embodiment of the present invention. The navigation system **100** includes a first device **102**, such as a client or a server, connected to a second device **106**, such as a client or server, with a communication path **104**, such as a wireless or wired network.

For example, the first device **102** can be of any of a variety of mobile devices, such as a cellular phone, personal digital assistant, a notebook computer, automotive telematic navigation system, or other multi-functional mobile communication or entertainment device. The first device **102** can be a standalone device, or can be incorporated with a vehicle, for example a car, truck, bus, or train. The first device **102** can couple to the communication path **104** to communicate with the second device **106**.

For illustrative purposes, the navigation system **100** is described with the first device **102** as a mobile computing device, although it is understood that the first device **102** can be different types of computing devices. For example, the first device **102** can also be a non-mobile computing device, such as a server, a server farm, or a desktop computer. In another example, the first device **102** can be a particularized machine, such as a mainframe, a server, a cluster server, rack mounted server, or a blade server, or as more specific examples, an IBM System z10™ Business Class mainframe or a HP ProLiant ML™ server.

The second device **106** can be any of a variety of centralized or decentralized computing devices. For example, the second device **106** can be a computer, grid computing resources, a virtualized computer resource, cloud computing resource, routers, switches, peer-to-peer distributed computing devices, or a combination thereof.

The second device **106** can be centralized in a single computer room, distributed across different rooms, distributed across different geographical locations, embedded within a telecommunications network. The second device **106** can have a means for coupling with the communication path **104** to communicate with the first device **102**. The second device **106** can also be a client type device as described for the first device **102**. Another example, the first device **102** or the second device **106** can be a particularized machine, such as a portable computing device, a thin client, a notebook, a netbook, a smartphone, a tablet, a personal digital assistant, or a cellular phone, and as specific examples, an Apple iPhone™, Android™ smartphone, or Windows™ platform smartphone.

For illustrative purposes, the navigation system **100** is described with the second device **106** as a non-mobile computing device, although it is understood that the second device **106** can be different types of computing devices. For example, the second device **106** can also be a mobile computing device, such as notebook computer, another client device, or a different type of client device. The second device **106** can be a standalone device, or can be incorporated with a vehicle, for example a car, truck, bus, or train.

Also for illustrative purposes, the navigation system **100** is shown with the second device **106** and the first device **102** as end points of the communication path **104**, although it is understood that the navigation system **100** can have a different partition between the first device **102**, the second device **106**, and the communication path **104**. For example, the first device **102**, the second device **106**, or a combination thereof can also function as part of the communication path **104**.

The communication path **104** can be a variety of networks. For example, the communication path **104** can include wireless communication, wired communication, optical, ultrasonic, or the combination thereof. Satellite communication, cellular communication, Bluetooth, Infrared Data Association standard (IrDA), wireless fidelity (WiFi), and worldwide interoperability for microwave access (WiMAX) are examples of wireless communication that can be included in the communication path **104**. Ethernet, digital subscriber line (DSL), fiber to the home (FTTH), and plain old telephone service (POTS) are examples of wired communication that can be included in the communication path **104**.

Further, the communication path **104** can traverse a number of network topologies and distances. For example, the communication path **104** can include direct connection, personal area network (PAN), local area network (LAN), metropolitan area network (MAN), wide area network (WAN) or any combination thereof.

Referring now to FIG. **2**, there is shown an example of a geographic area **202** traveled by the user of the navigation system **100**. For clarity and brevity, the discussion of the embodiment of the present invention will focus on the first device **102** delivering the result generated by the navigation system **100**. However, the second device **106** of FIG. **1** and the first device **102** can be discussed interchangeably.

The geographic area **202** can represent a metropolitan area, a rural area, or a combination thereof. The geographic area

202 can also represent a neighborhood, a city, a county, a state, a country, or a combination thereof. A geographic location 204 is defined as a place or a position in the geographic area 202. For example, the geographic location 204 can represent a building, a street intersection, a national park, or a combination thereof. The first device 102 can display the geographic area 202, the geographic location 204, or a combination thereof.

A current location 206 is defined as a position of the first device 102. A target destination 208 is defined as the geographic location 204 where the travel ends. For example, the target destination 208 can represent a waypoint, endpoint, or a combination thereof.

A geography feature 210 is defined as a characteristic of the geographic area 202, the geographic location 204, or a combination thereof. For example, the geography feature 210 of the geographic area 202 can represent a city, a farmland, a suburb, or a combination thereof. An architecture feature 212 is defined as a manmade characteristic for the geographic location 204. For example, the geographic location 204 can represent a house and the architecture feature 212 of the house can represent Victorian style.

A travel context 214 is defined as a situation, circumstance, or a combination thereof surrounding the first device 102. For example, the travel context 214 can be determined based on a travel condition 216. The travel condition 216 can include a travel time 218, a travel history 220, a travel theme 222, a road type 224, a visible radius 226, or a combination thereof.

The travel time 218 is defined as a time frame. For example, the travel time 218 can represent a time of day, week, month, year, or a combination thereof. For another example, the travel time 218 can represent a time span of day, week, month, year, or a combination thereof. The travel history 220 is defined a log of the user's travel. For example, the travel history 220 can indicate a frequency of how many times the user had traveled within the geographic area 202, had traveled to the geographic location 204, or a combination thereof logged by the first device 102 having the navigation system 100.

The travel theme 222 is a purpose for the travel. For example, the travel theme 222 can represent going for dinner in the geographic area 202 representing San Francisco, Calif. The road type 224 is a classification of a road. For example, the road type 224 can include local road, arterial road, express way, high occupancy vehicle lane, freeway, or a combination thereof. The visible radius 226 is a distance from the current location 206 to the geographic location 204 perceptible. For example, the visible radius 226 can represent the distance from the current location 206 where the user of the navigation system 100 can see the geographic location 204. For another example, the visible radius 226 can represent the distance from the current location 206 where a capturing sensor 228 can detect an object 230, the geographic location 204, or a combination thereof.

The capturing sensor 228 is defined as a device that captures the travel condition 216 surrounding the first device 102. The object 230 can include a person, a vehicle, a road fixture, a building, or a combination thereof.

The travel condition 216 can include a past condition 232, a present condition 234, a future condition 236, a continuing condition 238, or a combination thereof. The past condition 232 is defined as a situation that had already occurred. For example, if the user had passed by the geographic location 204 representing a railroad track, the fact that the user had drove over the railroad track can represent the past condition 232. The present condition 234 is defined as a situation currently occurring. For example, if the user is sitting on a red light, the fact that the user is stopped and waiting for the light to turn green can represent the present condition 234. The future condition 236 is defined as a situation that can occur in the travel. For example, if the user is going on a freeway from a local road as the user travels on a travel route 240, the freeway segment of the travel route 240 subsequent to the local road can represent the future condition 236. The travel route 240 is defined as a path to reach the target destination 208.

The travel context 214 can include a spatial-temporal context 242. The spatial-temporal context 242 can represent a situation, circumstance, or a combination thereof having a time component and physical component. For example, the spatial-temporal context 242 can represent a combination of the future condition 236 and the geographic location 204 to describe the situation. More specifically, the future condition 236 can represent the fact that the user will encounter a toll booth along the travel route 240. The geographic location 204 can represent the toll booth. The spatial-temporal context 242 can represent the travel context 214 that illustrates the combination of the temporal component and the physical component to aid the user's travel.

A category of interest 244 is defined as a classification of the object 230, the geographic location 204, the geographic area 202, or a combination thereof. For example, if the geographic location 204 serves Chinese food, the category of interest 244 can represent a restaurant. A brand 246 can represent a commercial label to distinguish from one instance of the geographic location 204 from another instance of the geographic location 204. For example, the golden arches can represent the brand 246 to distinguish McDonald's from other instance of the category of interest 244 representing fast food hamburger eateries.

Referring now to FIG. 3, there is shown an example of a navigation guidance 302. The navigation guidance 302 is defined as information provided by the navigation system 100 to aid the user' travel. For example, the navigation guidance 302 can represent an audio guidance 304, a visual guidance 306, or a combination thereof. The audio guidance 304 can represent the navigation guidance 302 presented by sound. The visual guidance 306 can represent the navigation guidance 302 displayed on the first device 102.

The navigation guidance 302 can include a landmark based guidance 308, a pre-emptive guidance 310, or a combination thereof having a guidance description 312. The guidance description 312 is defined as the detail of the navigation information to aid the user's travel. The landmark based guidance 308 is defined as the navigation guidance 302 having the guidance description 312 using a guidance landmark 314 to aid the user's travel. The guidance landmark 314 is defined as a conspicuous reference to aid the user's travel. For example, the guidance landmark 314 can be the geographic location 204 of FIG. 2 representing the Empire State Building in New York City. The guidance description 312 of the landmark based guidance 308 can represent "Your destination is across from the front entrance of Empire State Building."

The pre-emptive guidance 310 is defined as the navigation guidance 302 having the travel condition 216 of FIG. 2 in the guidance description 312 to provide the travel context 214 of FIG. 2 for the user's travel. For example, the pre-emptive guidance 310 can include the past condition 232 of FIG. 2, the present condition 234 of FIG. 2, the future condition 236 of FIG. 2, or a combination thereof in the guidance description 312. For a specific example, the guidance description 312 for the pre-emptive guidance 310 can include the present condition 234 such as "You are halfway across the San Mateo

Bridge" indicating that the travel context **214** of user had traveled the half the distance of a bridge.

The navigation guidance **302** can include a conversational guidance **316**. The conversational guidance **316** is defined as the navigation guidance **302** that expects a user's response **318**. The user's response **318** is defined as a user's entry in response to the information presented by the navigation system **100**. For example, the conversational guidance **316** can pose a question to the user to aid the navigation system **100** to make a decision on what information to present on the first device **102**. The user's response **318** can represent manual entry, audio response, biometric entry, or a combination thereof. The biometric entry can include fingerprint entry, retina scan, or a combination thereof.

Referring now to FIG. **4**, there is shown an example of the guidance landmark **314** of FIG. **3**. The guidance landmark **314** can be determined from one instance of a candidate landmark **402** or a plurality of the candidate landmark **402**. The candidate landmark **402** is defined as the object **230** of FIG. **2**, the geographic location **204** of FIG. **2**, the geographic area **202** of FIG. **2**, or a combination thereof considered to become the guidance landmark **314**. FIG. **4** can illustrate the first device **102** interacting with the second device **106** for the navigation system **100** to determine the guidance landmark **314** out of a plurality of the candidate land mark **402**.

For example, the candidate landmark **402** can include a popular landmark **404**, web cited landmark **406**, a sizable landmark **408**, a historical landmark **410**, a geography landmark **412**, an architectural landmark **414**, a categorized landmark **416**, a personal landmark **418**, a dynamic reference **420**, or a combination thereof. The popular landmark **404** is defined as a navigation reference decided according to the frequency of visits. For example, the popular landmark **404** can represent object **230**, the geographic location **204**, the geographic area **202** selected as the candidate landmark **402** based on the travel history **220** of FIG. **2**. More specifically, the geographic location **204** is selected as the popular landmark **404** based on a travel threshold **422**, a destination frequency **424**, a proximity frequency **426**, or a combination thereof.

The travel threshold **422** is defined as the minimum number visits to the geographic location **204**, the target destination **208** of FIG. **2**, or a combination thereof. For example, the travel threshold **422** can represent a number of visits greater than zero. The destination frequency **424** is defined as the number of visits to the geographic location **204**, the target destination **208**, or a combination thereof. The proximity frequency **426** is defined as the number of times passing by the geographic location **204**, the geographic area **202**, or a combination thereof during the user's travel.

The web cited landmark **406** is defined as a navigation reference determined according to the information on the Internet. For example, the web cited landmark **406** can represent object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on web information **428**, a presence frequency **430**, a presence threshold **432**, or a combination thereof. The web information **428** can represent content found on the Internet regarding the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. The presence frequency **430** is defined as a number of appearances for the web information **428** regarding the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. For example, the presence frequency **430** can represent a number of search results on the Internet related to the geographic location **204**. For another example, the web information **428** can represent a number of followers on a social network site for the geographic location **204**. For further example, the web information **428** can represent a number of ratings for the geographic location **204**. The presence threshold **432** is defined as a minimum number of the presence frequency **430**. For example, the presence threshold **432** can represent a value of the presence frequency **430** greater than zero.

The sizable landmark **408** is defined as a navigation reference having a location dimension **434**. For example, the sizable landmark **408** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on the location dimension **434**, a dimension threshold **436**, or a combination thereof. The location dimension **434** is defined as a spatial attribute of the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. For example, the location dimension **434** can represent a height, a width, a length, a diameter, a radius, a volume, or a combination thereof. The dimension threshold **436** is defined as a minimum requirement for the location dimension **434**.

The historical landmark **410** is defined as a navigation reference having historical significance. For example, the historical landmark **410** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on a location history **438**, a history threshold **440**, or a combination thereof. The location history **438** is defined an aggregate of event from the past to present for the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. For example, the location history **438** can represent the age of the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. The history threshold **440** is defined as the minimum instance of the location history **438** of the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof. For example, the history threshold **440** can represent the number of years present at the geographic location **204** greater than zero.

The geography landmark **412** is defined as a navigation reference having a geographical attribute. For example, the geography landmark **412** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on the geography feature **210** of FIG. **2**. For example, the geography landmark **412** can represent natural landscape, such as river, lake, mountain, or a combination thereof. For another example, the geography landmark **412** can represent manmade structure, such as the road type **224** in particular instance of the geographic area **202**.

The architectural landmark **414** is defined as a navigation reference with the architecture feature **212** of FIG. **2**. For example, the architectural landmark **414** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on the architecture feature **212**. For example, the architectural landmark **414** can represent a building with an Art Deco style.

The categorized landmark **416** is defined as a navigation reference categorized according to the category of interest **244** of FIG. **2**. For example, the categorized landmark **416** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on the category of interest **244**. For example, the category of interest **244** can represent restaurant. The categorized landmark **416** can represent the geographic location **204** representing a French restaurant.

The personal landmark **418** is defined as a personalized navigation reference. For example, the personal landmark **418** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on a user profile **442**. The user profile **442** is defined as user's personal information. For example, the user profile **442** can include a user's interest **444**. For example, the user's interest **444** can include user's preference to certain type of cuisine, entertainment, sports, or a combination thereof. The user profile **442** can include a vehicle type **446**. For example, the vehicle type **446** can represent gasoline vehicle, electric vehicle, or hybrid vehicle as the user's choice for mode of transportation.

For a different example, the personal landmark **418** can include a turn frequently taken by the user. More specifically, the user can usually merged from California 92 to Interstate 280 South, but for a particular trip the merge was at the same exit but heading north. The navigation system **100**, the navigation guidance **302** of FIG. **3** can represent "Take California 92 to 280 as if you were going to work, but head North on 280."

The dynamic reference **420** is defined as a navigation reference that can continuously change. For example, the dynamic reference **420** can represent the object **230**, the geographic location **204**, the geographic area **202**, or a combination thereof selected as the candidate landmark **402** based on the travel context **214** of FIG. **2**, the visible radius **226** of FIG. **2**, or a combination thereof. For further example, the dynamic reference **420** can represent a moving vehicle, a digital display of a billboard, or a combination thereof.

The guidance landmark **314** can be categorized according to a user's landmark **448**, a network's landmark **450**, a societal landmark **452**, or a combination thereof. The user's landmark **448** is defined as the guidance landmark **314** unshared. For example, the user's landmark **448** can represent the user's personal instance of the guidance landmark **314** unshared to other users. The network's landmark **450** is defined as the guidance landmark **314** shared amongst a user's contacts. For example, the network's landmark **450** can represent the guidance landmark **314** to user's friend in a social network site. The societal landmark **452** is defined as the guidance landmark **314** available to the public. For example, the societal landmark **452** can represent the guidance landmark **314** used by all people, inside and outside the user's network.

Referring now to FIG. **5**, therein is shown an exemplary block diagram of the navigation system **100**. The navigation system **100** can include the first device **102**, the communication path **104**, and the second device **106**. The first device **102** can send information in a first device transmission **508** over the communication path **104** to the second device **106**. The second device **106** can send information in a second device transmission **510** over the communication path **104** to the first device **102**.

For illustrative purposes, the navigation system **100** is shown with the first device **102** as a client device, although it is understood that the navigation system **100** can have the first device **102** as a different type of device. For example, the first device **102** can be a server.

Also for illustrative purposes, the navigation system **100** is shown with the second device **106** as a server, although it is understood that the navigation system **100** can have the second device **106** as a different type of device. For example, the second device **106** can be a client device.

For brevity of description in this embodiment of the present invention, the first device **102** will be described as a client device and the second device **106** will be described as a server device. The present invention is not limited to this selection for the type of devices. The selection is an example of the present invention.

The first device **102** can include a first control unit **512**, a first storage unit **514**, a first communication unit **516**, a first user interface **518**, and a location unit **520**. The first control unit **512** can include a first control interface **522**. The first control unit **512** can execute a first software **526** to provide the intelligence of the navigation system **100**. The first control unit **512** can be implemented in a number of different manners. For example, the first control unit **512** can be a processor, an embedded processor, a microprocessor, a hardware control logic, a hardware finite state machine (FSM), a digital signal processor (DSP), or a combination thereof. The first control interface **522** can be used for communication between the first control unit **512** and other functional units in the first device **102**. The first control interface **522** can also be used for communication that is external to the first device **102**.

The first control interface **522** can receive information from the other functional units or from external sources, or can transmit information to the other functional units or to external destinations. The external sources and the external destinations refer to sources and destinations physically separate from the first device **102**.

The first control interface **522** can be implemented in different ways and can include different implementations depending on which functional units or external units are being interfaced with the first control interface **522**. For example, the first control interface **522** can be implemented with a pressure sensor, an inertial sensor, a microelectromechanical system (MEMS), optical circuitry, waveguides, wireless circuitry, wireline circuitry, or a combination thereof.

The location unit **520** can generate location information, current heading, and current speed of the first device **102**, as examples. The location unit **520** can be implemented in many ways. For example, the location unit **520** can function as at least a part of a global positioning system (GPS), an inertial navigation system, a cellular-tower location system, a pressure location system, or any combination thereof.

The location unit **520** can include a location interface **532**. The location interface **532** can be used for communication between the location unit **520** and other functional units in the first device **102**. The location interface **532** can also be used for communication that is external to the first device **102**.

The location interface **532** can receive information from the other functional units or from external sources, or can transmit information to the other functional units or to external destinations. The external sources and the external destinations refer to sources and destinations physically separate from the first device **102**.

The location interface **532** can include different implementations depending on which functional units or external units are being interfaced with the location unit **520**. The location interface **532** can be implemented with technologies and techniques similar to the implementation of the first control interface **522**.

The first storage unit **514** can store the first software **526**. The first storage unit **514** can also store the relevant information, such as advertisements, points of interest (POI), navigation routing entries, or any combination thereof.

The first storage unit **514** can be a volatile memory, a nonvolatile memory, an internal memory, an external memory, or a combination thereof. For example, the first storage unit **514** can be a nonvolatile storage such as non-

volatile random access memory (NVRAM), Flash memory, disk storage, or a volatile storage such as static random access memory (SRAM).

The first storage unit **514** can include a first storage interface **524**. The first storage interface **524** can be used for communication between the location unit **520** and other functional units in the first device **102**. The first storage interface **524** can also be used for communication that is external to the first device **102**.

The first storage interface **524** can receive information from the other functional units or from external sources, or can transmit information to the other functional units or to external destinations. The external sources and the external destinations refer to sources and destinations physically separate from the first device **102**.

The first storage interface **524** can include different implementations depending on which functional units or external units are being interfaced with the first storage unit **514**. The first storage interface **524** can be implemented with technologies and techniques similar to the implementation of the first control interface **522**.

The first communication unit **516** can enable external communication to and from the first device **102**. For example, the first communication unit **516** can permit the first device **102** to communicate with the second device **106**, an attachment, such as a peripheral device or a computer desktop, and the communication path **104**.

The first communication unit **516** can also function as a communication hub allowing the first device **102** to function as part of the communication path **104** and not limited to be an end point or terminal unit to the communication path **104**. The first communication unit **516** can include active and passive components, such as microelectronics or an antenna, for interaction with the communication path **104**.

The first communication unit **516** can include a first communication interface **528**. The first communication interface **528** can be used for communication between the first communication unit **516** and other functional units in the first device **102**. The first communication interface **528** can receive information from the other functional units or can transmit information to the other functional units.

The first communication interface **528** can include different implementations depending on which functional units are being interfaced with the first communication unit **516**. The first communication interface **528** can be implemented with technologies and techniques similar to the implementation of the first control interface **522**.

The first user interface **518** allows a user (not shown) to interface and interact with the first device **102**. The first user interface **518** can include an input device and an output device. Examples of the input device of the first user interface **518** can include a keypad, a touchpad, soft-keys, a keyboard, a microphone, a camera, or any combination thereof to provide data and communication inputs.

The first user interface **518** can include a first display interface **530**. The first display interface **530** can include a display, a projector, a video screen, a speaker, a headset, or any combination thereof.

The first control unit **512** can operate the first user interface **518** to display information generated by the navigation system **100**. The first control unit **512** can also execute the first software **526** for the other functions of the navigation system **100**, including receiving location information from the location unit **520**. The first control unit **512** can further execute the first software **526** for interaction with the communication path **104** via the first communication unit **516**.

The second device **106** can be optimized for implementing the present invention in a multiple device embodiment with the first device **102**. The second device **106** can provide the additional or higher performance processing power compared to the first device **102**. The second device **106** can include a second control unit **534**, a second communication unit **536**, and a second user interface **538**.

The second user interface **538** allows a user (not shown) to interface and interact with the second device **106**. The second user interface **538** can include an input device and an output device. Examples of the input device of the second user interface **538** can include a keypad, a touchpad, soft-keys, a keyboard, a microphone, a camera, or any combination thereof to provide data and communication inputs. Examples of the output device of the second user interface **538** can include a second display interface **540**. The second display interface **540** can include a display, a projector, a video screen, a speaker, a headset, or any combination thereof.

The second control unit **534** can execute a second software **542** to provide the intelligence of the second device **106** of the navigation system **100**. The second software **542** can operate in conjunction with the first software **526**. The second control unit **534** can provide additional performance compared to the first control unit **512**.

The second control unit **534** can operate the second user interface **538** to display information. The second control unit **534** can also execute the second software **542** for the other functions of the navigation system **100**, including operating the second communication unit **536** to communicate with the first device **102** over the communication path **104**.

The second control unit **534** can be implemented in a number of different manners. For example, the second control unit **534** can be a processor, an embedded processor, a microprocessor, a hardware control logic, a hardware finite state machine (FSM), a digital signal processor (DSP), or a combination thereof.

The second control unit **534** can include a second control interface **544**. The second control interface **544** can be used for communication between the second control unit **534** and other functional units in the second device **106**. The second control interface **544** can also be used for communication that is external to the second device **106**.

The second control interface **544** can receive information from the other functional units or from external sources, or can transmit information to the other functional units or to external destinations. The external sources and the external destinations refer to sources and destinations physically separate from the second device **106**.

The second control interface **544** can be implemented in different ways and can include different implementations depending on which functional units or external units are being interfaced with the second control interface **544**. For example, the second control interface **544** can be implemented with a pressure sensor, an inertial sensor, a microelectromechanical system (MEMS), optical circuitry, waveguides, wireless circuitry, wireline circuitry, or a combination thereof.

A second storage unit **546** can store the second software **542**. The second storage unit **546** can also store the relevant information, such as advertisements, points of interest (POI), navigation routing entries, or any combination thereof. The second storage unit **546** can be sized to provide the additional storage capacity to supplement the first storage unit **514**.

For illustrative purposes, the second storage unit **546** is shown as a single element, although it is understood that the second storage unit **546** can be a distribution of storage elements. Also for illustrative purposes, the navigation system

100 is shown with the second storage unit 546 as a single hierarchy storage system, although it is understood that the navigation system 100 can have the second storage unit 546 in a different configuration. For example, the second storage unit 546 can be formed with different storage technologies forming a memory hierarchal system including different levels of caching, main memory, rotating media, or off-line storage.

The second storage unit 546 can be a volatile memory, a nonvolatile memory, an internal memory, an external memory, or a combination thereof. For example, the second storage unit 546 can be a nonvolatile storage such as nonvolatile random access memory (NVRAM), Flash memory, disk storage, or a volatile storage such as static random access memory (SRAM).

The second storage unit 546 can include a second storage interface 548. The second storage interface 548 can be used for communication between the location unit 520 and other functional units in the second device 106. The second storage interface 548 can also be used for communication that is external to the second device 106.

The second storage interface 548 can receive information from the other functional units or from external sources, or can transmit information to the other functional units or to external destinations. The external sources and the external destinations refer to sources and destinations physically separate from the second device 106.

The second storage interface 548 can include different implementations depending on which functional units or external units are being interfaced with the second storage unit 546. The second storage interface 548 can be implemented with technologies and techniques similar to the implementation of the second control interface 544.

The second communication unit 536 can enable external communication to and from the second device 106. For example, the second communication unit 536 can permit the second device 106 to communicate with the first device 102 over the communication path 104.

The second communication unit 536 can also function as a communication hub allowing the second device 106 to function as part of the communication path 104 and not limited to be an end point or terminal unit to the communication path 104. The second communication unit 536 can include active and passive components, such as microelectronics or an antenna, for interaction with the communication path 104.

The second communication unit 536 can include a second communication interface 550. The second communication interface 550 can be used for communication between the second communication unit 536 and other functional units in the second device 106. The second communication interface 550 can receive information from the other functional units or can transmit information to the other functional units.

The second communication interface 550 can include different implementations depending on which functional units are being interfaced with the second communication unit 536. The second communication interface 550 can be implemented with technologies and techniques similar to the implementation of the second control interface 544.

The first communication unit 516 can couple with the communication path 104 to send information to the second device 106 in the first device transmission 508. The second device 106 can receive information in the second communication unit 536 from the first device transmission 508 of the communication path 104.

The second communication unit 536 can couple with the communication path 104 to send information to the first device 102 in the second device transmission 510. The first device 102 can receive information in the first communication unit 516 from the second device transmission 510 of the communication path 104. The navigation system 100 can be executed by the first control unit 512, the second control unit 534, or a combination thereof.

A first capturing sensor 552 can represent the capturing senor 228 of FIG. 2. The first capturing sensor 552 can capture the inanimate object location 230 of FIG. 2 in the traversal context 218 of FIG. 2. The first capturing sensor 552 can capture the inanimate object location 230 from the outside, the inside, or the combination thereof of the user's vehicle.

Examples of the first capturing sensor 552 can include a digital camera, video camera, thermal camera, night vision camera, infrared camera, x-ray camera, or the combination thereof. Examples of the first capturing sensor 552 can include accelerometer, thermometer, microphone, wireless signal receiver, remote physiological monitoring device, light identifier, or the combination thereof.

A second capturing sensor 554 can represent the capturing senor 228. The second capturing sensor 554 can capture the inanimate object location 230 in the traversal context 218. The second capturing sensor 554 can capture the inanimate object location 230 from the outside, the inside, or the combination thereof of the user's vehicle.

Examples of the second capturing sensor 354 can include a digital camera, video camera, thermal camera, night vision camera, infrared camera, x-ray camera, or the combination thereof. Examples of the second capturing sensor 354 can include accelerometer, thermometer, microphone, wireless signal receiver, remote physiological monitoring device, light identifier, or the combination thereof.

For illustrative purposes, the second device 106 is shown with the partition having the second user interface 538, the second storage unit 546, the second control unit 534, and the second communication unit 536, although it is understood that the second device 106 can have a different partition. For example, the second software 542 can be partitioned differently such that some or all of its function can be in the second control unit 534 and the second communication unit 536. Also, the second device 106 can include other functional units not shown in FIG. 5 for clarity.

The functional units in the first device 102 can work individually and independently of the other functional units. The first device 102 can work individually and independently from the second device 106 and the communication path 104.

The functional units in the second device 106 can work individually and independently of the other functional units. The second device 106 can work individually and independently from the first device 102 and the communication path 104.

For illustrative purposes, the navigation system 100 is described by operation of the first device 102 and the second device 106. It is understood that the first device 102 and the second device 106 can operate any of the modules and functions of the navigation system 100. For example, the first device 102 is described to operate the location unit 520, although it is understood that the second device 106 can also operate the location unit 520.

Referring now to FIG. 6, therein is shown a control flow of the navigation system 100. The navigation system 100 can include a context module 602. The context module 602 determines the travel context 214 of FIG. 2. For example, the context module 602 can determine the travel context 214 based on the travel condition 216 of FIG. 2.

The context module 602 can determine the travel context 214 in a number of ways. For example, the context module

602 can determine the travel context 214 based on the travel condition 216 surrounding the vehicle with the user of the navigation system 100 operating the first device 102. More specifically, the travel condition 216 can include the travel time 218 of FIG. 2, the travel theme 222 of FIG. 2, the road type 224 of FIG. 2, the current location 206 of FIG. 2, the travel history 220 of FIG. 2, or a combination thereof.

For a specific example, the context module 602 can determine the travel context 214 representing that the user is traveling at night based on the travel time 218 representing 9 PM.

For another example, the context module 602 can determine the travel context 214 representing that the user is traveling at high speed based on the location unit 520 of FIG. 5 locating the current location 206 on the road type 224 representing a freeway. For further example, the context module 602 can determine the travel context 214 that the user is unfamiliar with the geographic area 202 of FIG. 2 based on the travel history 220 meeting or exceeding the travel threshold 422 of FIG. 4. The context module 602 can send the travel context 214 to a landmark module 604.

The navigation system 100 can include a candidate module 606. The candidate module 606 determines the candidate landmark 402 of FIG. 4. For example, the candidate module 606 can determine the candidate landmark 402 representing the popular landmark 404 of FIG. 4, the web cited landmark 406 of FIG. 4, the sizable landmark 408 of FIG. 4, the historical landmark 410 of FIG. 4, the geography landmark 412 of FIG. 4, the architectural landmark 414 of FIG. 4, the categorized landmark 416 of FIG. 4, the personal landmark 418 of FIG. 4, the dynamic reference 420 of FIG. 4, or a combination thereof determined.

The candidate module 606 can determine the candidate landmark 402 in a number of ways. The candidate module 606 can include a popularity module 608. The popularity module 608 determines the popular landmark 404. For example, the popularity module 608 can determine the popular landmark 404 based on the travel history 220.

The popularity module 608 can determine the popular landmark 404 in in a number of ways. For example, the popularity module 608 can determine the popular landmark 404 based on the travel history 220 representing the destination frequency 424 of FIG. 4, the proximity frequency 426 of FIG. 4, or a combination thereof.

As an example, the popularity module 608 can determine the popular landmark 404 based on the geographic location 204 of FIG. 2 selected as the target destination 208 of FIG. 2 based on the destination frequency 424. More specifically, the destination frequency 424 can indicate the number of times visited for the geographic location 204 by the user, the user's friend, or a combination thereof. The travel threshold 422 can represent traveling to the geographic location 204 of at least 10 times within the travel time 218 of 1 week. As a result, the popularity module 608 can determine the popular landmark 404 based on the geographic location 204 based on the destination frequency 424 meeting or exceeding the travel threshold 422 of FIG. 4.

For another example, the popularity module 608 can determine the popular landmark 404 based on the proximity frequency 426. More specifically, the popularity module 608 can determine the popular landmark 404 based on the geographic location 204 most frequently passed by the user, the user's friend, or a combination thereof. For further example, the popularity module 608 can determine the popular landmark 404 based on the geographic location 204 within the visible radius 226 of FIG. 2. As an example, the visible radius 226 can be set as 2 mile radius from the current location 206. The popularity module 608 can determine the popular landmark 404 based on the geographic location 204 within the visible radius 226 frequently passed by according to the proximity frequency 426. The travel threshold 422 can represent passing by the geographic location 204 of at least 10 times within the travel time 218 of 1 week. The popularity module 608 can determine the popular landmark 404 based on the proximity frequency 426 meeting or exceeding the travel threshold 422.

For another example, the popularity module 608 can determine the popular landmark 404 based on the travel history 220, the road type 224, or a combination thereof. More specifically, the travel history 220 indicates the user rarely travels on dirt road. As a result, the popularity module 608 can determine the geographic location 204 as the popular landmark 404 excluding the dirt road. The popularity module 608 can send the popular landmark 404 to the landmark module 604.

The candidate module 606 can include a presence module 610. The presence module 610 determines the web cited landmark 406. For example, the presence module 610 can determine the web cited landmark 406 based on the presence frequency 430 of FIG. 4 of the geographic location 204. The web cited landmark 406 can represent the geographic location 204, the geographic area 202, or a combination thereof.

It has been discovered that the navigation system 100 determining the popular landmark 404 can improve the safety of user operating the vehicle, the navigation system 100, or a combination thereof. By determining the popular landmark 404 as the candidate landmark 406 for the guidance landmark 314 of FIG. 3, the navigation system 100 can improve the user's comfort level of traversing the travel route 240 of FIG. 2 by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system 100, or a combination thereof.

The presence module 610 can determine the web cited landmark 406 in a number of ways. For example, the presence module 610 can determine the presence frequency 430 based on the first control interface 522 of FIG. 5 receiving the web information 428 of FIG. 4 for the geographic location 204, the geographic area 202, or a combination thereof from the external sources. The web information 428 can represent the name of a website, search engine, social network site, or a combination thereof citing the geographic location 204, the geographic area 202, or a combination thereof.

The presence module 610 can determine the presence frequency 430 based on the web information 428, such a number of web pages citing the geographic location 204, a number of search results generated for the geographic area 202, a number of positive responses, such as "likes," indicated towards the geographic location 204 on a social network site, or a combination thereof. The presence threshold 432 can represent at least 1000 websites, 1 million search results, 500 "likes," or a combination thereof citing the geographic location 204, the geographic area 202, or a combination thereof. The presence module 610 can determine the web cited landmark 406 based on the presence frequency 430 meeting or exceeding the presence threshold 432 of FIG. 4.

For a specific example, the presence frequency 430 for the geographic location 204, such as Haight-Ashbury in San Francisco, Calif. can exceed the presence threshold 432. For another example, the presence frequency 430 for the geographic area 202, such as Greenwich.

Village in New York City, N.Y. can exceed the presence threshold 432. The presence module 610 can determine Haight-Ashbury, Greenwich Village, or a combination

thereof as the web cited landmark **406**. The presence module **610** can send the web cited landmark **406** to the landmark module **604**.

It has been discovered that the navigation system **100** determining the web cited landmark **406** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the web cited landmark **406** as the candidate landmark **406** for the guidance landmark **314**, the navigation system **100** can improve the user's comfort level for traversing the travel route **240** by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system **100**, or a combination thereof.

The candidate module **606** can include a footprint module **612**. The footprint module **612** determines the sizable landmark **408**. For example, the footprint module **612** can determine the sizable landmark **408** based on the location dimension **434** of FIG. **4** meeting or exceeding the dimension threshold **436** of FIG. **4**.

The footprint module **612** can determine the sizable landmark **408** in a number of ways. For example, the geographic location **204** can represent a skyscraper. The location dimension **434** representing the height of the skyscraper can be 100 meters tall. The dimension threshold **436** representing the height can represent at least 75 meters. Because the location dimension **434** exceeds the dimension threshold **436**, the footprint module **612** can determine the skyscraper as the sizable landmark **408**.

For another example, the geographic location **204** can represent a sports stadium. The location dimension **434** representing the volume of the sports stadium can be 19 million cubic meters. The dimension threshold **436** representing the volume can represent at least 10 million cubic meters. Because the location dimension **434** exceeds the dimension threshold **436**, the footprint module **612** can determine the sports stadium as the sizable landmark **408**. The footprint module **612** can send the sizable landmark **408** to the landmark module **604**.

It has been discovered that the navigation system **100** determining the sizable landmark **408** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the sizable landmark **408** as the candidate landmark **406** for the guidance landmark **314**, the navigation system **100** can improve the user's comfort level for traversing the travel route **240** by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system **100**, or a combination thereof.

The candidate module **606** can include a history module **614**. The history module **614** determines the historical landmark **410**. For example, the history module **614** can determine the historical landmark **410** based on the location history **438** of FIG. **4** of the geographic location **204**.

More specifically, the history module **614** can determine the historical landmark **410** based on the location history **438** meeting or exceeding the history threshold **440** of FIG. **4**. As an example, the history threshold **440** can represent at least 10 years for the restaurant to be existent at the geographic location **204**. If the location history **438** of the restaurant can represent 15 years, the history module **614** can determine the restaurant as the historical landmark **410** based on the location history **438** exceeding the history threshold **440**.

For further example, a building no longer existent can represent the historical landmark **410** based on the location history **438** of the building. For example, the building can have the location history **438** of 50 years. However, the building can perish due to a fire. The history module **614** can still determine the building as the historical landmark **410** based on the location history **438** of the building exceeding the history threshold **440**. The history module **614** can send the historical landmark **410** to the landmark module **604**.

It has been discovered that the navigation system **100** determining the historical landmark **410** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the historical landmark **410** as the candidate landmark **406** for the guidance landmark **314**, the navigation system **100** can improve the user's comfort level for traversing the travel route **240** by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system **100**, or a combination thereof.

The candidate module **606** can include a geography module **616**. The geography module **616** determines the geography landmark **412**. For example, the geography module **616** can determine the geography landmark **412** based on the geography feature **210** of FIG. **2**.

The geography module **616** can determine the geography landmark **412** in a number of ways. As an example, one instance of the geography feature **210** can represent a natural landscape, such as river, lake, mountain, or a combination thereof. The geographic area **202** can represent a metropolitan area having instances of the geography feature **210** representing buildings. Having a river, lake, or a combination thereof can represent an anomaly to a metropolitan area where the geographic area **202** can be surrounded by buildings, houses, and roads. The geography module **616** can determine the geography landmark **412** based on comparing the one instance of the geography feature **210** to another instance of the geography feature **210** within the geographic area **202**.

For another example, the geography feature **210** can represent the number of lanes for the road type **224** represent a freeway. Generally, the particular freeway can have the geography feature **210** of 4 lanes. However, for a particular instance of the geographic area **202**, the freeway can have the geography feature **210** of 5 lanes. The geography module **616** can determine the geography landmark **412** based on comparing the geography feature **210** for the geography feature **210** of one instance of the geographic area **202** to the geography feature **210** of another instance of the geographic area **202**. The geography module **616** can send the geography landmark **412** to the landmark module **604**.

The candidate module **606** can include an architecture module **618**. The architecture module **618** determines the architectural landmark **414**. For example, the architecture module **618** can determine the architectural landmark **414** based on the architecture feature **212** of FIG. **2**.

The architecture module **618** can determine the architectural landmark **414** in a number of ways. For example, the architecture module **618** can determine the architectural landmark **414** based on the architecture feature **212** of the brand **246** of FIG. **2**. For example, the brand **246** can represent McDonald's™. The architecture feature **212** can represent the golden arches of McDonald's™. Based on the architecture feature **212**, the architecture module **618** can determine the geographic location **204** with the gold arches to be the architectural landmark **414** representing McDonald's™.

For another example, the architecture module **618** can determine the architectural landmark **414** based on the architecture feature **212** captured by the first capturing sensor **552** of FIG. **5**. More specifically, the first capturing sensor **552** can

capture the digital image of the architecture feature **212** for each instances of the geographic location **204** within the geographic area **202**. The architecture module **618** can determine the architectural landmark **414** based on identifying the architecture feature **212** distinctive amongst the instances of the architecture feature **212** using an image recognition algorithm. Some examples of the image recognition algorithm can include a contour and shape based object recognition method, an appearance-based object recognition method, and anchor point detection algorithm.

For a specific example, the geographic area **202** can predominantly have instances of the geographic location **204** with the architecture feature **212** of Victorian style houses. The geographic area **202** can have an instance of the geographic location **204** with the architecture feature **212** of Contemporary-Modern style house. The architecture module **618** can determine the geographic location **204** with the architecture feature **212** of Contemporary-Modern style house as the architectural landmark **414** by comparing the Contemporary-Modern style to the Victorian style with the image recognition algorithm. Moreover, the architecture module **618** can determine the architectural landmark **414** based on selecting the geographic location **204** having the architecture feature **212** unavailable to other instances of the geographic location **204**. The architecture module **618** can send the architectural landmark **414** to the landmark module **604**.

The candidate module **606** can include a category module **620**. The category module **620** determines the categorized landmark **416**. For example, the category module **620** can determine the categorized landmark **416** based on the category of interest **244** of FIG. **2**, the travel history **220**, or a combination thereof.

More specifically, the category module **620** can determine the categorized landmark **416** based on the travel history **220** meeting or exceeding the travel threshold **422** for the category of interest **244**. The category of interest **244** of the geographic location **204** can represent amusement park. The travel threshold **422** can represent visitation of at least 10 times within the travel time **218** of 1 year. The travel history **220** can indicate that the user of the candidate module **606** visited the amusement park 12 times within 1 year. The category module **620** can determine the categorized landmark **416** based on selecting the geographic location **204** with the travel history **220** meeting exceeding the travel threshold **422** for the category of interest **244**

It has been discovered that the navigation system **100** determining the categorized landmark **416** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the categorized landmark **416** as the candidate landmark **406** for the guidance landmark **314**, the navigation system **100** can improve the user's comfort level for traversing the travel route **240** by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system **100**, or a combination thereof.

The candidate module **606** can include a profile module **622**. The profile module **622** determines the personal landmark **418**. For example, the profile module **622** can determine the personal landmark **418** based on the user profile **442** of FIG. **4**.

The profile module **622** can determine the personal landmark **418** in a number of ways. For example, the profile module **622** can determine the personal landmark **418** based on the user profile **442** having the user's home address, work address, or a combination thereof. The profile module **622** can determine the personal landmark **418** to represent the home address, the work address, or a combination thereof.

For another example, the user profile **442** can include the user's interest **444** of FIG. **4**. The user's interest **444** can represent user's favorite sports team, user's favorite activity, or a combination thereof. More specifically, the user's favorite sports team can represent the San Francisco Giants, an American baseball team. The profile module **622** can determine the personal landmark **418** based on the user's interest **444** by selecting the geographic location **204** representing the Giant's home stadium as the personal landmark **418**.

For further example, user's favorite activity can represent "reading," "hiking," or a combination thereof. The profile module **622** can determine the personal landmark **418** based on the user's interest **444** by selecting the geographic location **204** catering to user's favorite activity, such as a bookstore, outdoor gear shop, or a combination thereof.

For another example, the user profile **442** can include the vehicle type **446** of FIG. **4**. More specifically, the profile module **622** can determine the personal landmark **418** based on the vehicle type **446**. More specifically, the vehicle type **446** can represent Bentley™, an English high-end car. The profile module **622** can determine geographic location **204** representing Prada™, a high-end fashion store, over REI™, an outdoor gear store, as the personal landmark **418** based on the vehicle type **446** that the user operates. The profile module **622** can send the personal landmark **418** to the landmark module **604**.

It has been discovered that the navigation system **100** determining the personal landmark **418** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the personal landmark **418** as the candidate landmark **406** for the guidance landmark **314**, the navigation system **100** can improve the user's comfort level for traversing the travel route **240** by providing a recognizable navigation reference for the user to rely on. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system **100**, or a combination thereof.

The candidate module **606** can include a dynamic module **624**. The dynamic module **624** determines the dynamic reference **420**. For example, the dynamic module **624** can determine the dynamic reference **420** based on the travel context **214**, the visible radius **226**, or a combination thereof.

The dynamic module **624** can determine the dynamic reference **420** in a number of ways. For example, the dynamic module **624** can determine the dynamic reference **420** based on the object **230** of FIG. **2** captured by the first capturing sensor **552**. More specifically, the first capturing sensor **552** can capture the object **230** within the visible radius **226** and determine the object **230** as the dynamic reference **420**. For a specific example, the object **230** can represent a black car. The travel context **214** can indicate that the black car ahead of the user makes a right turn at the corner where the travel route **240** will guide the user to make the turn. The black car can be within the visible radius **226** of the first capturing sensor **552**, thus, capturing the digital image of the black car. The dynamic module **624** can decipher the object **230** as the black car using the image recognition algorithm as discussed above. The dynamic module **624** can determine the black car as the dynamic reference **420**. The dynamic module **624** can send the dynamic reference **420** to the landmark module **604**.

It has been discovered that the navigation system **100** determining the dynamic reference **420** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By determining the dynamic reference **420** as the candidate landmark **406** for the guidance landmark

314, the navigation system 100 can improve the user's comfort level for traversing the travel route 240 by providing a recognizable navigation reference for the user to rely on in real-time. As a result, the increased comfort level allows the user to focus for safer operation of the vehicle, the navigation system 100, or a combination thereof.

The navigation system 100 can include the landmark module 604, which can couple to the context module 602, the candidate module 606, or a combination thereof. The landmark module 604 determines the guidance landmark 314. For example, the landmark module 604 can determine the guidance landmark 314 based on the travel context 214, the popular landmark 404, the web cited landmark 406, the sizable landmark 408, the historical landmark 410, the geography landmark 412, the architectural landmark 414, the categorized landmark 416, the personal landmark 418, the dynamic reference 420, or a combination thereof.

The landmark module 604 can determine the guidance landmark 314 in a number of ways. For example, the landmark module 604 can determine the guidance landmark 314 based on selecting from a plurality of the candidate landmark 402. More specifically, the landmark module 604 can determine the guidance landmark 314 based on selecting the candidate landmark 402 according to the travel context 214, the user profile 442, or a combination thereof.

For further example, the landmark module 604 can determine the guidance landmark 314 representing the user's landmark 448 of FIG. 4, the network's landmark 450 of FIG. 4, the societal landmark 452 of FIG. 4, or a combination thereof. More specifically, the landmark module 604 can generate the user's landmark 448 based on the personal landmark 418, the travel context 214, or a combination thereof. The travel context 214 can represent the user attending a baseball game for an away game. The personal landmark 418 can represent the baseball stadium that the user is heading towards. The landmark module 604 can determine the personal landmark 418 as the user's landmark 448 for the travel context 214 of attending the baseball game in a different city.

For another example, the landmark module 604 can determine the popular landmark 404 as the user's landmark 448 based on the travel history 220 of user passing by the geographic location 204 daily. As another example, the travel context 214 can represent driving through the geographic area 202 representing a city having blocked buildings. The landmark module 604 can determine the web cited landmark 406 and the historical landmark 410, representing the same instance of the geographic location 204, as the network's landmark 450 to be shared amongst the user and user's friends as the guidance landmark 314 that is prominent for traveling through the city.

For a different example, the travel context 214 can represent nighttime. The landmark module 604 can determine the architectural landmark 414 having the architecture feature 212 for the brand of McDonald's™ as the societal landmark 452 for selecting the guidance landmark 314 that is easily recognizable to general population within the geographic area 202.

For further example, the landmark module 604 can rank the candidate landmark 402 based on the travel context 214, the user profile 442, or a combination thereof for selecting the candidate landmark 402 as the guidance landmark 314. More specifically, the travel context 214 can represent user's home town. The landmark module 604 can rank the candidate landmark 402 representing the popular landmark 404 over the sizable landmark 408 because of the user's familiarity of the geographic area 202 for selecting as the guidance landmark 314.

In contrast, the landmark module 604 can rank the historical landmark 410, the sizable landmark 408, or a combination thereof over the popular landmark 404 based on the travel context 214 of out of town. The popular landmark 404 can be a weak factor to be considered since the travel history 220 indicates the users has never traveled in the geographic region. As a result, the landmark module 604 can select the historical landmark 410, the sizable landmark 408, or a combination thereof as the guidance landmark 314 for selecting the candidate landmark 402 that is more easily recognizable. The landmark module 604 can send the guidance landmark 314 to a navigation module 626.

The navigation system 100 can include the navigation module 626, which can couple the landmark module 604. The navigation module 626 generates the navigation guidance 302 of FIG. 3. For example, the navigation module 626 can generate the navigation guidance 302 representing the landmark based guidance 308 of FIG. 3, the pre-emptive guidance 310 of FIG. 3, the audio guidance 304 of FIG. 3, the conversational guidance 316 of FIG. 3, or a combination thereof based on the guidance landmark 314.

The navigation module 626 can generate the navigation guidance 302 in a number of ways. The navigation module 626 can include a route module 628. The route module 628 generates the travel route 240. For example, the route module 628 can generate the travel route 240 from the current location 206 to the target destination 208.

The route module 628 can generate the travel route 240 in a number of ways. For example, the route module 628 can generate the travel route 240 having the guidance landmark 314 to guide the user from the current location 206 to the target destination 208. More specifically, the route module 628 can generate the travel route 240 having a plurality of the guidance landmark 314 to personalize the navigation guidance 302 suited for the travel context 214 to reach the target destination 208.

For example, the travel context 214 can represent daytime with good visibility. The route module 628 can generate the travel route 240 including the guidance landmark 314 representing the sizable landmark 408, such as the skyscraper, to aid the user to locate his relative location on the travel route 240, the geographic area 202, or a combination thereof.

For another example, the travel context 214 can represent nighttime with poor visibility. The route module 628 can generate the travel route 240 including the guidance landmark 314 representing the architectural landmark 414, such as the golden arches of McDonald's™, to aid the user to locate his relative location on the travel route 240, the geographic area 202, or a combination thereof.

For further example, the route module 628 can generate the travel route 240 routing to the guidance landmark 314 prior to reaching the target destination 208. As a result, the route module 628 can generate the navigation guidance 302 with the guidance landmark 314 serving as a checkpoint for improving the user's ability to reach the target destination 208. The route module 628 can send the travel route 240 to a guidance module 630.

The navigation module 626 can include a guidance module 630, which can couple to the route module 628. The guidance module 630 generates the guidance description 312 of FIG. 3. For example, the guidance module 630 can generate the landmark based guidance 308, the pre-emptive guidance 310, the conversational guidance 316, or a combination thereof having the guidance description 312 suited for the travel context 214.

The guidance module 630 can generate the landmark based guidance 308, the pre-emptive guidance 310, the conversational guidance 316, or a combination thereof in a number of

ways. For example, the guidance module **630** can generate the landmark based guidance **308** having the guidance landmark **314** as part of the guidance description **312**. More specifically, the travel route **240** can include the target destination **208** situated between two instances of the guidance landmark **314**. The two instances can represent a train station and a movie theatre. The guidance module **630** can generate the landmark based guidance **308** having the guidance description **312** as "Your destination is between the train station and the movie theater." The "destination" used in the guidance description **312** is synonymous with the target destination **208**.

For another example, the travel context **214** can represent the current location **206** of the user which passed by the guidance landmark **314** representing a golf course. The guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "Your destination is half a mile past the golf course."

For another example, the target destination **208** representing a restaurant can be adjacent to the guidance landmark **314** representing a theatre. The guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "This restaurant is across from the Majestic Theater."

For another example, the guidance module **630** can determine the cardinal direction of the guidance landmark **314** relative to the target destination **208** or vice versa. The guidance landmark **314** can represent Central Park. The guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "Your destination is two blocks west of Central Park."

For another example, the guidance description **312** can base on the visible radius **226**. More specifically, the guidance description **312** can include the guidance landmark **314** within the visible radius **226** to provide a reference point to the user. The guidance landmark **314** can represent a shopping mall. Moreover, the shopping mall can locate further away from the target destination **208**. Since the shopping mall is within the visible radius **226** and further away from the target destination **208**, the guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "Your destination is one mile before the shopping mall."

For another example, the guidance description **312** can based on the dynamic reference **420** selected as the guidance landmark **314**. The dynamic reference **420** can represent a black car making a right turn at the corner where the travel route **240** will guide the user to make a turn. The guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "Make a right turn where the black car made the right turn."

For a different example, the guidance module **630** can generate the pre-emptive guidance **310** based on the travel condition **216** representing the past condition **232** of FIG. **2**, the present condition **234** of FIG. **2**, the future condition **236** of FIG. **2**, the continuing condition **238** of FIG. **2**, or a combination thereof. For a specific example, the past condition **232** can represent the guidance landmark **314** representing the Bay Bridge which the user had passed by two kilometers ago. The guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** with the past condition **232** as "You have passed the Bay Bridge two kilometers ago" to provide the travel context **214** of where the current location **206** is located.

For another example, the present condition **234** can represent the guidance landmark **314** representing the categorized landmark **416**, such as Starbucks Coffee™. The guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** with the present condition **234** as "You are passing by Starbucks Coffee to your right" to provide the travel context **214** of where the current location **206** is located.

For another example, the future condition **236** can represent the guidance landmark **314** representing the geography landmark **412**, such as a railroad track, that the user can encounter one kilometer ahead. The guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** with the future condition **236** as "You will cross a railroad track in one mile" to provide the travel context **214** of what the user can expect along the travel route **240**.

For another example, the continuing condition **238** can represent the guidance landmark **314** representing the geography landmark **412**, such as a river, that the travel route **240** parallels. The guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** with the continuing condition **238** as "You will be driving along a path that parallels the river to your left for the next two kilometers" to provide the travel context **214** of where the current location **206** is located.

For further example, the guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** providing the spatial-temporal context **242** of FIG. **2**. More specifically, the spatial-temporal context **242** can include the time component, such as the past condition **232**, the present condition **234**, the future condition **236**, or a combination thereof as discussed above. Furthermore, the spatial-temporal context **242** can include the physical component such as a variety of the guidance landmark **314**.

For a specific example, the guidance landmark **314** can represent the geography landmark **412** of a toll booth. The future condition **236** can represent "after the toll booth." The guidance module **630** can generate the pre-emptive guidance **310** having the guidance description **312** with the spatial-temporal context **242** as "After the toll booth, take Interstate 76 towards Philadelphia" to provide the travel context **214** of what the user can anticipate along the travel route **240**.

For a different example, the guidance module **630** can generate the conversational guidance **316** to factor the user's response **318** of FIG. **3**. More specifically, the guidance module **630** can generate the conversational guidance **316** having the guidance description **312** posing a question with a reference to the guidance landmark **314**. For a specific example, the guidance landmark **314** can represent an American flag. The guidance module **630** can generate the conversational guidance **316** having the guidance description **312** as "Do you see the American flag ahead?" The guidance module **630** can receive the user's response **318** as "yes" or "no."

Based on the user's response **318**, the guidance module **630** can generate the conversational guidance **316** to provide the subsequent instance of the navigation guidance **302**, such as the landmark based guidance **308**. For example, if the user's response **318** is "yes," the guidance module **630** can generate the landmark based guidance **308** with the guidance description **312** as "Turn left at the corner with the American flag." The guidance module **630** can send the landmark based guidance **308**, the pre-emptive guidance **310**, the conversational guidance **316**, or a combination thereof to an audio module **632**. The guidance module **630** can send the navigation guidance **302** to an audio module **632**, a display module **634**, or a combination thereof.

It has been discovered that the navigation system **100** generating the pre-emptive guidance **310** can improve the safety of user operating the vehicle, the navigation system **100**, or a combination thereof. By generating the pre-emptive guidance

310, the navigation system 100 can improve the user's comfort level for traversing the travel route 240 by providing a recognizable navigation reference for the user to rely on the past condition 232, the present condition 234, the future condition 236, the continuing condition 238, or a combination thereof. Further, the recognition of the guidance landmark 314 within the spatial-temporal context 242 can improve the efficiency of recognizing the navigation reference. As a result, the increased comfort level and improved efficiency allow the user to focus for safer operation of the vehicle, the navigation system 100, or a combination thereof.

The navigation module 626 can include the audio module 632, which can couple to the guidance module 630. The audio module 632 generates the audio guidance 304. For example, the audio module 632 can generate the audio guidance 304 based on the navigation guidance 302.

The navigation module 626 can include the display module 634, which can couple to the guidance module 630. The display module 634 displays the navigation guidance 302. For example, the display module 634 can display the navigation guidance 302 with the travel route 240 from the current location to the target destination 208 passing by the guidance landmark 314.

For illustrative purposes, the navigation system 100 is described with the candidate module 606 determining the candidate landmark 402, although it is understood that the candidate module 606 can update the candidate landmark 402.

More specifically, as the user traverses the travel route 240, the travel context 212 and the travel condition 216 can change. The candidate module 606 can update the candidate landmark 402 based on the travel context 212, the travel condition 216, or a combination thereof changed to determine the guidance landmark 314 suited for the travel context 212.

The physical transformation from traveling from one instance of the travel context 214 to another instance of the travel context 214 results in the movement in the physical world, such as people using the first device 102, the vehicle, or a combination thereof, based on the operation of the navigation system 100. As the movement in the physical world occurs, the movement itself creates additional information that is converted back into determining the candidate landmark 402, the guidance landmark 314, or a combination thereof, generating the navigation guidance 302, or a combination thereof for the continued operation of the navigation system 100 and to continue the movement in the physical world.

The first software 526 of FIG. 5 of the first device 102 of FIG. 5 can include the modules for the navigation system 100. For example, the first software 526 can include the context module 602, the candidate module 606, the landmark module 604, and the navigation module 626.

The first control unit 512 of FIG. 5 can execute the first software 526 for the context module 602 to determine the travel context 214. The first control unit 512 can execute the first software 526 for the candidate module 606 to determine the candidate landmark 402. The first control unit 512 can execute the first software 526 for the landmark module 604 to determine the guidance landmark 314. The first control unit 512 can execute the first software 526 for the navigation module 626 to generate the navigation guidance 302.

The second software 542 of FIG. 5 of the second device 106 of FIG. 5 can include the modules for the navigation system 100. For example, the second software 542 can include the context module 602, the candidate module 606, the landmark module 604, and the navigation module 626.

The second control unit 534 of FIG. 5 can execute the second software 542 for the context module 602 to determine the travel context 214. The second control unit 534 can execute the second software 542 for the candidate module 606 to determine the candidate landmark 402. The second control unit 534 can execute the second software 542 for the landmark module 604 to determine the guidance landmark 314. The second control unit 534 can execute the second software 542 for the navigation module 626 to generate the navigation guidance 302.

The modules of the navigation system 100 can be partitioned between the first software 526 and the second software 542. The second software 542 can include the context module 602, the candidate module 606, and the landmark module 604. The second control unit 534 can execute modules partitioned on the second software 542 as previously described.

The first software 526 can include the navigation module 626. Based on the size of the first storage unit 514 of FIG. 5, the first software 526 can include additional modules of the navigation system 100. The first control unit 512 can execute the modules partitioned on the first software 526 as previously described.

The first control unit 512 can operate the first communication interface 528 of FIG. 5 to communicate the current location 206, the navigation guidance 302, or a combination thereof to or from the second device 106. The first control unit 512 can operate the first software 526 to operate the location unit 520 of FIG. 5. The second control unit 534 can operate the second communication interface 550 of FIG. 5 to communicate the guidance landmark 314, the navigation guidance 302, or a combination thereof to or from the first device 102 through the communication path 104 of FIG. 5.

The first control unit 512 can operate the first user interface 518 of FIG. 5 to present the navigation guidance 302. The second control unit 534 can operate the second user interface 538 of FIG. 5 to present the navigation guidance 302.

The navigation system 100 describes the module functions or order as an example. The modules can be partitioned differently. For example, the candidate module 606 and the landmark module 604 can be combined. Each of the modules can operate individually and independently of the other modules. Furthermore, data generated in one module can be used by another module without being directly coupled to each other. For example, the landmark module 604 can receive the travel context 214 from the context module 602. Further, one module communicating to another module can represent one module sending, receiving, or a combination thereof the data generated to or from another module.

The modules described in this application can be hardware implementation or hardware accelerators in the first control unit 512 or in the second control unit 534. The modules can also be hardware implementation or hardware accelerators within the first device 102 or the second device 106 but outside of the first control unit 512 or the second control unit 534, respectively as depicted in FIG. 5. However, it is understood that the first control unit 512, the second control unit 534, or a combination thereof can collectively refer to all hardware accelerators for the modules. Furthermore, the first control unit 512, the second control unit 534, or a combination thereof can be implemented as software, hardware, or a combination thereof.

The modules described in this application can be implemented as instructions stored on a non-transitory computer readable medium to be executed by the first control unit 512, the second control unit 534, or a combination thereof. The non-transitory computer medium can include the first storage unit 514, the second storage unit 546 of FIG. 5, or a combi-

nation thereof. The non-transitory computer readable medium can include non-volatile memory, such as a hard disk drive, non-volatile random access memory (NVRAM), solid-state storage device (SSD), compact disk (CD), digital video disk (DVD), or universal serial bus (USB) flash memory devices. The non-transitory computer readable medium can be integrated as a part of the navigation system **100** or installed as a removable portion of the navigation system **100**.

It has been discovered that the navigation system **100** determining the travel context **212** based on the travel condition **216** improves the user's awareness traversing the travel route **240**. Further, by determining the guidance landmark **314** from the candidate landmark **402** improves the efficiency of the user understanding the navigation guidance **302** generated by the navigation system **100**. More specifically, the navigation system **100** can generate the navigation guidance **302** most suited for the travel context **212** to improve the user's comfort level traversing the travel route **240**. As a result, the navigation system **100** can improve the safety of the user operating the vehicle, the navigation system **100**, or a combination thereof.

Referring now to FIG. **7**, therein is shown a flow chart of a method **700** of operation of the navigation system **100** in a further embodiment of the present invention. The method **700** includes: determining a travel context based on a travel condition in a block **702**; determining a guidance landmark based on a candidate landmark in a block **704**; and generating a navigation guidance with a control unit having the guidance landmark suited for the travel context for presenting with a device in a block **706**.

The resulting method, process, apparatus, device, product, and/or system is straightforward, cost-effective, uncomplicated, highly versatile, accurate, sensitive, and effective, and can be implemented by adapting known components for ready, efficient, and economical manufacturing, application, and utilization. Another important aspect of the present invention is that it valuably supports and services the historical trend of reducing costs, simplifying systems, and increasing performance. These and other valuable aspects of the present invention consequently further the state of the technology to at least the next level.

While the invention has been described in conjunction with a specific best mode, it is to be understood that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the aforegoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations that fall within the scope of the included claims. All matters hithertofore set forth herein or shown in the accompanying drawings are to be interpreted in an illustrative and non-limiting sense.

What is claimed is:

1. A method of operation of a navigation system comprising:

determining a travel context based on a travel condition;

determining a popular landmark as a candidate landmark based on a destination frequency to a geographic location meeting or exceeding a travel threshold;

determining a sizable landmark as another instance of the candidate land mark based on a. location dimension meeting or exceeding a dimension threshold;

determining a guidance landmark based on multiple instances of the candidate landmark including the popular landmark, the sizable landmark, or a combination thereof; and

generating a navigation guidance with a control unit having the guidance landmark suited for the travel context for presenting with a device.

2. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a pre-emptive guidance based on a past condition for providing the travel context of a current location.

3. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a pre-emptive guidance based on a present condition for providing the travel context of a current location.

4. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a pre-emptive guidance based on a future condition for providing the travel context of traversing a travel route.

5. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a pre-emptive guidance based on a continuous condition for providing the travel context of a current location.

6. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a pre-emptive guidance having a guidance description for providing a spatial-temporal context of traversing a travel route.

7. The method as claimed in claim **1** wherein generating the navigation guidance includes generating a conversational guidance having a guidance description with the guidance landmark for seeking a user's response.

8. The method as claimed in claim **1** wherein determining the guidance landmark includes determining the guidance landmark based on selecting the candidate landmark according the travel context, a user profile, or a combination thereof.

9. The method as claimed in claim **1** further comprising determining the candidate landmark representing a personal landmark based on a user profile for personalizing the guidance landmark.

10. The method as claimed in claim **1** further comprising determining the candidate landmark representing a dynamic reference for identifying an object changing as the guidance landmark.

11. A navigation system comprising:

a control unit for:

determining a travel context based on a travel condition,

determining a popular landmark as a candidate landmark based on a destination frequency to a geographic location meeting or exceeding a travel threshold,

determining a sizable landmark as another instance of the candidate land mark based on a location dimension meeting or exceeding a dimension threshold,

determining a guidance landmark based on multiple instances of the candidate landmark including the popular landmark, the sizable landmark, or a combination thereof,

generating a navigation guidance having the guidance landmark suited for the travel context, and

a communication interface, coupled to the control unit, for communicating the navigation guidance for presenting on a device.

12. The system as claimed in claim **11** wherein the control unit is for generating a pre-emptive guidance based on a past condition for providing the travel context of a current location.

13. The system as claimed in claim **11** wherein the control unit is for generating a pre-emptive guidance based on a present condition for providing the travel context of a current location.

14. The system as claimed in claim **11** wherein the control unit is for generating a pre-emptive guidance based on a future condition for providing the travel context of traversing a travel route.

15. The system as claimed in claim 11 wherein the control unit is for generating a pre-emptive guidance based on a continuous condition for providing the travel context of a current location.

16. A non-transitory computer readable medium comprising:

determining a travel context based on a travel condition;

determining a popular landmark as a candidate landmark based on a destination frequency to a geographic location meeting or exceeding a travel threshold;

determining a sizable landmark as another instance of the candidate land mark based on a location dimension meeting or exceeding a dimension threshold;

determining a guidance landmark based on multiple instances of the candidate landmark including the popular landmark, the sizable landmark, or a combination thereof; and

generating a navigation guidance having the guidance landmark suited for the travel context for presenting with a device.

17. The non-transitory computer readable medium as claimed in claim 16 wherein generating a pre-emptive guidance based on a past condition for providing the travel context of a current location.

18. The non-transitory computer readable medium as claimed in claim 16 wherein generating a pre-emptive guidance based on a present condition for providing the travel context of a current location.

19. The non-transitory computer readable medium as claimed in claim 16 wherein generating a pre-emptive guidance based on a future condition for providing the travel context of traversing a travel route.

20. The non-transitory computer readable medium as claimed in claim 16 wherein generating a pre-emptive guidance based on a continuous condition for providing the travel context of a current location.

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